



The Exploratorium Teacher Institute and Institute for Inquiry Present

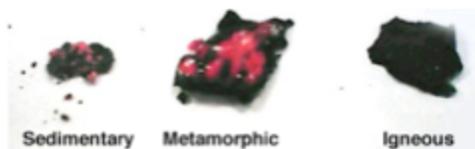
NGSS STEM Conference 2020

All Systems Go!

Investigating Earth Systems Science in All Science Classrooms

The Crayon Rock Cycle

Drawing conclusions about rocks with colored wax.



This activity is an introduction to the rock cycle by using wax crayons. Crayons have the ability to be ground into small particles (weathered), heated, cooled and compressed just like rocks. However, unlike rocks, all these processes can be done safely and at reasonable temperatures. Using crayons students can create sedimentary, metamorphic and igneous crayons.

Materials:

- Crayons – at least two different colors of wax crayons, at least one stick per student
- Source of very hot water
- Aluminum Foil and/or foil cupcake cups
- Bowl or container to hold hot water
- Pencil sharpener or simple scraping device (popsicle stick², plastic knives....)

To do and notice:

To make a Sedimentary Crayon:

1. You need to make small, particle sized sediments out of your crayons. These can be scraped from a new crayons (which can also be considered an igneous crayon), a sedimentary block of crayon, a metamorphic block of crayon or an igneous block of crayon. Shave crayons with the pencil sharpener, or scrape crayons with popsicle sticks, plastic knives or other grating tools.
2. Gather a pile of sediments collected from various scraped crayons.
3. Pressing down on this pile will allow the particles to stick together. Encasing the sediments between sheets of paper, foil, etc will help keep the sediments together. Using a utensil or stepping on your pile will help this process along too.
4. Your coherent bunch of crayon sediments is now equivalent to a sedimentary crayon.

To make a Metamorphic Crayon:

1. Place a small pile of sedimentary, metamorphic or igneous crayons into a piece of aluminum foil or foil cupcake cup.
2. Float this foil on hot water. Watch as the heat from the water transfers to the foil and to the crayons. The crayons should start to melt.
3. Remove the foil when the crayon wax is soft to the touch (don't use your finger, use a probe such as a popsicle stick).
4. Let your crayons cool. Your partially melted and cooled crayons are now equivalent to metamorphic crayons.

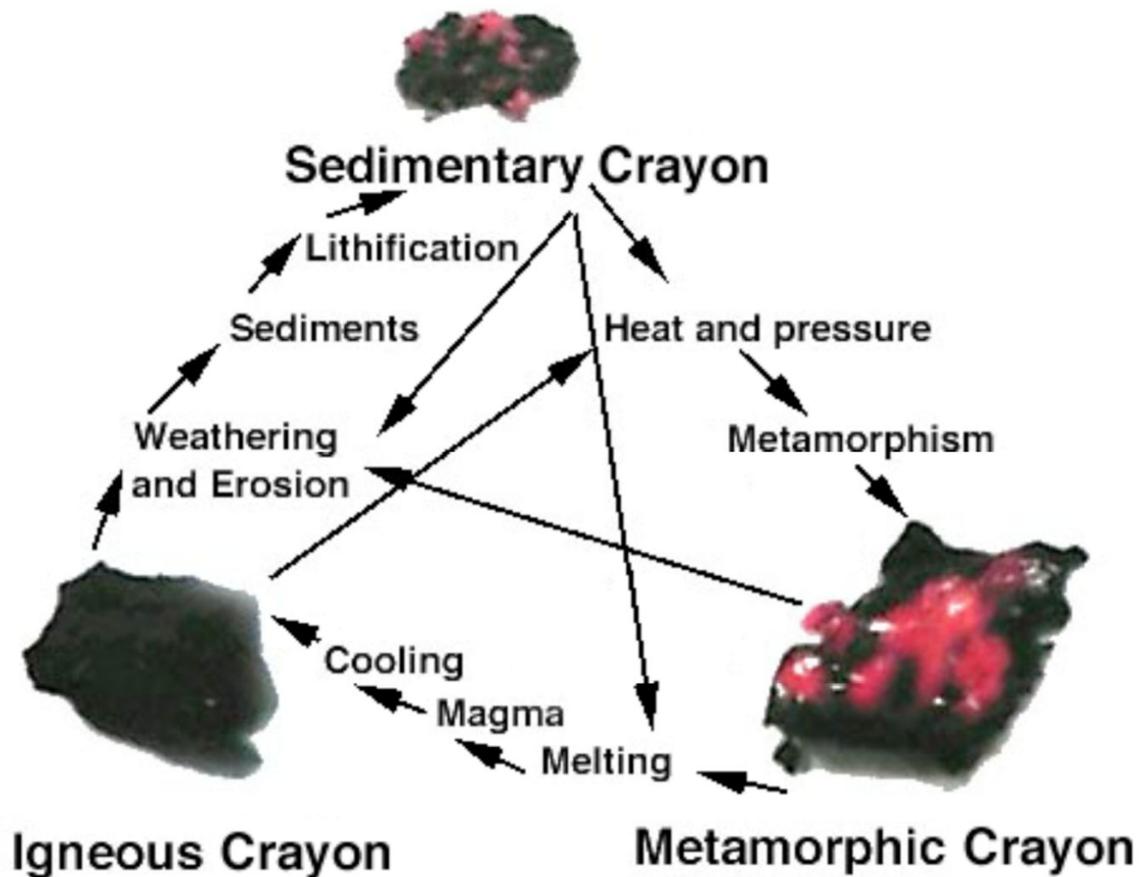
To make an Igneous Crayon:

1. Place a small pile of sedimentary, metamorphic or igneous crayons into a piece of aluminum foil or foil cupcake cup.
2. Float this crayon containing foil on hot water. Watch as the heat from the water transfers to the foil and to the crayons. The crayons should start to melt. The crayons should be allowed to melt until a smooth liquid forms.
3. Carefully remove molten crayon wax and let cool. Your totally melted and cooled crayons are now equivalent to igneous crayons.

What's going on?

This crayon cycle is designed to model the rock cycle. The rock cycle is a continuing process that has occurred throughout geologic time. One type of rock can become another rock type over time. This process can be thought of as a cycle and can be diagrammed (see below). The particles that constitute an igneous rock held in one's

hands today may become part of a sedimentary or metamorphic rock in the distant future. Very little rock on the surface of the earth has remained fixed in its original rock type. Most rocks have undergone several iterations of the rock cycle.³



Author credit: Eric Muller, Exploratorium Teacher Institute

¹ Aluminum foil cupcake molds work well for this step – idea from Coral Clark.

² Use of a popsicle sticks for younger children - idea from Coral Clark.

³ The oldest known rocks on the surface of the earth are 3.8 billion years old (found in Greenland).